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SUBJECT Data Concerning Coal Carbonization Plants
Built by Lurgi

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THIS IS UNEVALUATED INFORMATION

1.

In the low temperature carbonization plants (System Lurgi) no toluene or aromatics were recovered from the coal. Any benzene recovered was not a benzene in the chemical meaning of that product, but a raw material called light oil i.e., a mixture of hydrocarbons boiling mainly around 200-220°C, but actually starting to boil around 180°C and ending at about 325°C.

2.

All the tar, including the light oil, produced in the low temperature carbonization plants was directly sent to hydrogenation plants with the exception of Anhaltische Kohlenbergwerke, Profen, which used its tar in its own refinery at Kopsen. Dea-Regis used the main part of the tar in its own refinery at Rositz and sent a part of this oil fraction directly to the Navy, as a fuel oil, as did Oberschlesische Hydrierwerke, Blechhammer.

3. Information concerning Coal Carbonisation Plants using the Lurgi Process follows:

- (a) Naihoru, Sakhalin Island - The plant was operated by high-grade lignite mined on the spot. In 1935, two carbonisers with a daily capacity of 350 tons were started. This plant was later enlarged. The lignite was carbonised as delivered from the mine, after crushing and screening. The tar oils - about 10% of the coal carbonised - were refined in an adjacent plant where benzene, paraffin, diesel oil,

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and pitch coke were produced. The main product, of course, was char (white low temperature coke), which was used in place of charcoal and sold for household use (open fires in homes). Data concerning the quantities of products recovered are not known. There were a large number of working men at the plant, in addition to eleven chemists, one mechanical engineer and some mining engineers. The operating force, was very ambitious and quickly learned to operate and manage the plant. Working time was 12 hours i e, two shifts per day.

- (b) AG Sachsische Werke, Bohlen - Soviet Zone - This plant had twenty-four carbonizers with a total capacity of approximately 63 hundred tons of brown coal briquettes per day. About 750 tons of tar oil were recovered per day and sent to the adjacent hydrogenation plant of Braun Kohlenbinzen, AG (Brabag). The labor, especially the foremen and engineers of the plant, were highly skilled in their work. [] number of employees in the carbonization and briquetting plant was about 120 men per shift. About 5,850 tons of briquettes per day were made from brown coal dried from 94% moisture to 15% moisture and pressed in plunger presses to small square blocks weighing, approximately, 150 grams each. Practically no briquettes, made for carbonization purposes, were sold on the outside market. About 450 tons of briquettes per day were made in ring presses. The char (brown coal low temperature coke) of these briquettes was separately screened, and the coarse material sold on the open market. The char from the plunger press briquettes was mainly pulverized and burned in the boilerhouse of the power station. A part of the fine coke, about four hundred tons per day, was gasified in Winkler Generators for the production of hydrogen used in the Brabag hydrogenation works. The char yield was about 50% of the briquettes carbonized. Surplus gas, amounting to about 220 BTU/cu ft per day, was burned in the boiler house. A part of the carbonization gas was desulphurized in AG Sachsische Werke Alkali plant at Bohlen and solid sulphur was produced.

- (c) AG Sachsische Werke, Espenhain - Soviet Zone - This plant had thirty carbonizers with a total capacity of about eighty-two hundred tons of brown coal briquettes per day. The briquettes were made from brown coal (about 54% moisture) dried in rotary steam heated driers and pressed in plunger presses into square blocks with about 15% H₂O and weighing about 150 grams. Practically no briquettes, made for carbonization purposes, were sold on the outside market. The char was mainly pulverized and burned in the boiler house of the power station. A part of the char was sent to Brabag and used as fuel in Winkler gasifiers. About nine hundred tons of tar oil was produced per day and mainly shipped to Brabag for carbonization. A smaller part was used in an adjacent Edelmann plant. Paraffin, diesel oil, gasoline, fuel oil and pitch coke were produced at Edelmann. The brown coal, of the open cut Espenhain mine, was relatively high in its sulphur content. The gas for heating purposes, and the surplus gas, were washed from hydrogen-sulphide in a potash solution. The hydrogen-sulphide was burned in a Claus-oven and solid sulphur was produced. The surplus gas was partly used in the plant and partly burned in the boiler house.

Labor, foremen and engineers were of average skill. [] recall the exact number of men employed in the carbonization and briquetting plant, but would estimate the number to be about one hundred and fifty men per shift.

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- (d) A G Sachsische Werke, Hirschfelde - Soviet Zone - This plant had six carbonizers with a total capacity of 16 hundred tons of briquettes per day. The briquettes, about 11 hundred tons, were mainly made in plunger presses and the balance of about five hundred tons, in Ring presses from lignite mined in a nearby strip mine, now belonging to Poland.

Labor, foremen and engineers were skilled in their work. []

[] number of men employed in the carbonization and briquetting plant []
to be about thirty men per shift.

About two hundred tons of tar oil per day were produced and sent to the different Brabag works for hydrogenation. The char produced was screened and shipped for household and industrial use.

- (e) Riebeck'sche, Montan Werke, Deuben - Soviet Zone - This plant had six carbonizers with a total capacity of about 18 hundred tons of brown coal briquettes per day. About 2 hundred tons of tar oil were produced per day and sent for hydrogenation to the Leuna Works. Labor and foremen as well as engineers were skilled in their work. [] number of men employed in the carbonization plant []
[] to be about thirty men per shift.

Briquettes for the carbonizers were made from brown coal dried in rotary steam driers from 56% to about 15% of moisture and pressed into small blocks (approximately 150 gr in weight) in plunger presses. About 450 tons of briquettes per day were made from brown coal dried in hot gas driers (Lurgi System). The raw brown coal for these driers was crushed below 1/8" and dried from about 56% of moisture to 8 + 10% of moisture in a hot gas stream of 8000 - 10000 and pulverized, by this thermic action, at the same time. The dried coal was cooled in a cooling gas stream and briquetted in ring presses under a pressure of about 37,000 lbs/sq inch. The square-shaped briquettes had a weight of about 80 gr each. The screened char was shipped to the Leuna Works and used as a gasification fuel in Winkler gasifiers, while the lump char (hard coke) was sold as a household and industrial fuel.

- (f) Riebeck'sche Montanwerke, Nachterstedt - Soviet Zone - This plant had four carbonizers with a total capacity of about eleven hundred tons of brown-coal briquettes per day. About half of these briquettes were made in plunger presses and half in ring presses. About 125 tons of tar oil was produced per day and shipped to the Leuna Works for hydrogenation.

Labor, foremen and engineers were skilled in their work. []

[] number of men employed in the carbonization plant and ring press briquetting plant []
[] to be about thirty men per shift.

The screened char was shipped to the Leuna Works and used as a gasification fuel in Winkler gasifiers, while the lump char was sold as a household and industrial fuel. The raw brown coal, used for briquetting, contained about 54% moisture. The tar produced was relatively high in its paraffin content, and therefore preferred by the hydrogenation people.

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- (g) Anhaltische Kohlenbergwerke, Profen - Soviet Zone - This plant had three carbonizers with a total capacity of about nine hundred tons per day of ring briquettes and a smaller amount of plunger briquettes. About one hundred and ten tons of tar oil per day were produced and sent to the Kopsen oil-refinery located near the village of Kopsen. The char produced was screened and sold on the open market for household and industrial purposes. Laborers, foremen and engineers were skilled in their work. [] number of men employed in the carbonization and briquetting plant [] employed about twenty-five men per shift.

In 1947 this plant ran carbonization tests with Russian coal from the Baikal Lake region. These tests, with this coal as delivered, resulted in a char useful for gasification purposes.

- (h) Braunkohlenwerke Salzdetfurth, Deutzen - Soviet Zone - This plant had five carbonizers with a total capacity of about 1750 tons of brown coal briquettes per day. About 180 tons of tar oil were produced per day and sent to the Brabag works of Proglitz located near Zeitz. About four hundred tons of briquettes per day were made in Ring presses working in connection with a Buttner drier. The rest of the carbonized briquettes were made in plunger presses. This Deutzen plant made the best plunger briquettes for carbonization purposes of any carbonization plant using such briquettes. The reason was an additionally-installed screening system for the dried coal before this coal was fed into the presses. In that way, any oversize material high in moisture content, was separated and returned to the rotary dryer. The water (moisture) margin in the dried coal briquetted was therefore, relatively small, resulting in excellent briquettes. Good briquettes and some improvements inside of one carbonizer resulted in a capacity of that unit of 450 tons per day.

Labor, foreman and engineers were skilled in their work. []

[] number of men employed in the carbonization and ring-press briquetting plant [] about forty men per shift.

- (i) Deutsche Erdöl AG, Regis-Breitungen - Soviet Zone - This plant had ten carbonizers with a total capacity of about three thousand tons of brown coal briquettes per day. About 350 tons of tar oil were produced per day. All the tar oils were sent to the refinery at Rositz, with the exception of a tar oil fraction separated in electro filters, which was shipped to the Navy as a fuel oil.

Labor, foreman and engineers were skilled in their work. []

[] number of men employed in the carbonization and briquetting plant [] about seventy-five men per shift.

About 25 hundred tons of briquettes per day, for the carbonizers, were made with ring presses, at the plant site and the rest of the briquettes were made with plunger presses in nearby briquetting plants. All the char produced was screened and sold in different sizes for household and different industrial uses. Surplus gas was used to evaporate carbonization water in round ovens and exposed in the atmosphere. The complete plant was dismantled in 1947, by the Soviets, and shipped to the USSR.

- (j) Braunschweigische Kohlenbergwerke, Offleben - Soviet Zone - This plant had ten carbonizers with a total capacity of about three thousand tons per day of brown coal briquettes. About 260 tons

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of tar oil per day were produced and sent to the Brabag Works at Magdeburg (Rothensee). The latter plant was dismantled by the Soviets and shipped to the USSR (location unknown). The Offleben plant was located 10 Kilometers south of Helmstedt in the UK Zone, while the brown coal mine, from which the raw brown coal was received, was located nearby in the Soviet Zone at Budenstedt.

Plant labor, foremen and engineers were skilled in their work. [] number of men employed in the entire plant [] was about seventy-five men per shift.

The briquettes for the carbonizers were made from brown coal dried in a hot gas stream from 54% to about 15% moisture and pressed into small square blocks (approximately 150 gr in weight) in plunger presses. As the capacity of the briquetting plant was not big enough to supply the briquette demand, some briquettes were shipped in from the nearby briquetting plant of Bismark. The char was mainly shipped to the nearby Harpke power station and burned in their boiler house. A part of the char was screened. This fine material was shipped to the Brabag works in Magdeburg for gasification in Winkler gasifiers. The coarse material was sold for household and industrial purposes. Surplus gas, with a calorific value of about 220 BTU/cu ft, was piped to the steam plant of the Treue briquetting plant, located nearby, and burned under steam boilers.

- (k) (Formerly Sudetenlandische Treibstoff Werke), Bruix-Stalino - Czechoslovakia - This plant had eight carbonizers with a daily capacity of approximately 24 thousand tons of lignite. The lignite, containing about 28% moisture, was screened into different sizes and carbonized in different carbonizers. Maximum throughput and maximum tar recovery resulted in this type of operation. About three thousand tons of tar oil was produced per day and hydrogenated in their hydrogenation plant. The char produced was screened and used in the boiler house for producing steam, in Winkler gasifiers, for the production of hydrogen, and a little sold on the open market for household and industrial purposes.

Labor, foremen and engineers of the plant were of average skill in their work. [] number of men employed in the carbonization plant, including raw coal and char screening plants [] to be about two hundred men per shift.

The raw coal was mined in nearby mines and shipped in by railroad.

- (l) Oberschlesische Hydrierwerke, Blechhammer - Poland - This plant had fourteen carbonizers with a daily capacity of approximately thirty-five hundred tons, of which about five hundred tons was screened bituminous coal according to the Weber Process.

The screened coal carbonized was a fraction of about 3/4" to 1" in size with a coking index (Backzahl) of 0 to 5 according to Damm. The coke produced from this coal was mainly used in small gas producers mounted on trucks or buses. A smaller part was used for different industrial purposes and also as household fuel. The briquettes were made from ground bituminous coal, having a coking index (Backzahl) of 5 to 10 according to Damm, mixed with 1% of fine-ground tar pitch, about 6% of sulfite lye (residue from pulp mills) and a small amount of water. The

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mixture was fluxed and pressed in roller presses into egg-shaped briquettes about 2½ ounces in weight. The briquettes were dried in wire-mesh belt driers and cooled on a steel-trough conveyor before being charged into the carbonizers. The coke produced from the briquettes, having about 1-2% volatile (matter carbonization temperature 1000°C), was used in water gas producers for the production of hydrogen used in their hydrogenation plant. About one hundred thousand tons of tar oils were produced per year. The pitch fraction was used for hydrogenation and the oil fraction was topped and shipped to the Navy as fuel oil. The light oil fraction recovered was also used for hydrogenation. Surplus gas was used for heating purposes in the boiler house of their power station. The complete works including power station, hydrogenation plant, gasification plant, chemical water treatment (Phenosolvan) plant, and all underground piping was dismantled by the Soviets and shipped to the USSR during 1945-1946. [REDACTED]

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